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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,167	07/30/2003	James Albert Matthews	10030278-1	1888

57299 7590 01/23/2007

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EXAMINER	
YAM, STEPHEN K	
ART UNIT	PAPER NUMBER
2878	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/632,167	MATTHEWS, JAMES ALBERT	
	Examiner	Art Unit	
	Stephen Yam	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5,6,10,11 and 19-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,6,10,11 and 19-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to Amendments and remarks filed on October 26, 2006. Claims 1, 5, 6, 10, 11, and 19-23 are currently pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5, 6, 10, 11, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. US Patent No. 6,879,014 in view of Morris, Jr. et al. US Patent No. 6,452,669.

Regarding Claim 1, Wagner et al. teach (see Fig. 1, 4 and 8) an integrated optical apparatus (100) configured to detect light transmitted from a light source (402) external to the integrated optical apparatus (see Fig. 4), the integrated optical apparatus comprising a substrate (106) (see Fig. 8), and an optical element including a plurality of stacked layers (101-103) of optically transmissive material (see Fig. 1 and Col. 8, lines 39-40) formed on the substrate (see Fig. 8), wherein at least one of the layers (101-103) of optically transmissive material is a sensing element (see Col. 8, lines 30-38) having a resistance responsive to incident light (as a photodiode operating in reverse bias (see Col. 9, lines 38-43) has a resistance proportional to incident light). Wagner et al. do not teach the apparatus diffracting light with the optical element as a diffractive optical element. Morris, Jr. et al. teach (see Fig. 4) a similar apparatus with a

diffractive optical element (see Col. 2, lines 63-67) including a plurality of stacked layers (20, 30) of optically transmissive material, wherein at least one of the layers (20) of optically transmissive material (see Col. 2, lines 55-63) as a sensing element (See Col. 3, lines 1-9) having a resistance responsive to incident light (since the photodiode is operating in reverse bias - see Col. 3, lines 1-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the optical element as a diffractive optical element for the optical apparatus to diffract light, as taught by Morris, Jr. et al., in the apparatus of Wagner et al., to provide a desired interference effect for optimal light transmission and propagation.

Regarding Claim 5, Wagner et al. teach the sensing element configured to provide (using 104, 105) a response to a control circuit, external to the integrated optical apparatus (see Col. 12, lines 22-23 and Col. 16, lines 25-26 and Col. 19, lines 30-33, 57-60), for measuring the response of the sensing element to incident light and for controlling the light source (see Col. 19, lines 25-33).

Regarding Claim 6, Wagner et al. teach the light source as a laser (see Col. 10, lines 8-11).

Regarding Claim 10, Wagner et al. teach a first (104) and second (105) contact on the sensing element for measuring the resistance of the sensing element (through operation of the photodiode in reverse bias).

Regarding Claim 11, Wagner et al. teach the optically transmissive material including a semiconductor (see Col. 8, lines 30-35).

Regarding Claim 19, Wagner et al. teach the temperature of the sensing element as responsive to light (since all objects increase temperature to some degree when impacted by laser energy).

Regarding Claim 20, Wagner et al. teach at least two of the layers (101, 103) of optically transmissive material are sensing elements (see Col. 8, lines 35-36) having resistances responsive to incident light (through operation of the photodiode in reverse bias).

Regarding Claim 21, Wagner et al. teach at least two adjacent layers (101, 103) of optically transmissive material are sensing elements (see Col. 8, lines 35-36) having resistances responsive to incident light (through operation of the photodiode in reverse bias).

Regarding Claim 22, Wagner et al. teach at least two non-adjacent layers (101, 102) of optically transmissive material are sensing elements (see Col. 8, lines 35-36) having resistances responsive to incident light (through operation of the photodiode in reverse bias).

Regarding Claim 23, Wagner et al. teach all of the layers (101-103) of optically transmissive material are sensing elements (see Col. 8, lines 35-36) having resistances responsive to incident light (through operation of the photodiode in reverse bias).

Response to Arguments

3. Applicant's arguments filed October 26, 2006 have been fully considered but they are not persuasive.

Applicant argues that Wagner does not teach that one of the layers of optically transmissive material is a sensing element having a resistance responsive to incident light, but instead teaches a PIN diode formed by multiple layers which forms a resistance between the top

conductor 104 and bottom conductor 105. Examiner respectfully disagrees. Wagner discloses that the layers 101-103 are optically transmissive, from Fig. 1 where light 107 is transmitted thru the layers (further disclosed in Col. 8, lines 39-40). Furthermore, Wagner discloses the layers 101-103 forming a PIN photodiode (see Col. 8, line 30) which can operate in reverse bias (see Col. 9, lines 38-40). As known in the art, a PIN photodiode in reverse bias operates by a modification in its resistance when light is absorbed the layers of the photodiode.

> "A photodiode is a p-n junction or p-i-n structure. When light of sufficient photon energy strikes the diode, it excites an electron thereby creating a mobile electron and a positively charged electron hole. If the absorption occurs in the junction's depletion region, these carriers are swept from the junction by the built-in field of the depletion region, producing a photocurrent.
> ...
> Diodes usually have extremely high resistance when reverse-biased. This resistance is reduced when light of an appropriate frequency shines on the junction. Hence, a reverse-biased diode can be used as a detector by monitoring the current running through it. Circuits based on this effect are more sensitive to light than ones based on the photovoltaic effect."
>
> (from Wikipedia (see Page 1 of attached copy): *http://en.wikipedia.org/wiki/Photodiode* emphasis placed in underline)

Thus, Examiner asserts that the layers 101-103 which form the PIN photodiode of Wagner (composed of layers 101-103) are optically transmissive and are a sensing element having a resistance responsive to incident light.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SY

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THANH X. LUU
PRIMARY EXAMINER